Before the Federal Communications Commission Washington, D.C. 20554

In the Matter of	
Applications for Consent to the Transfer of Control of Licenses	
MediaOne Group, Inc.) Transferor,)	CS Docket No. 99-251
To)	
AT&T Corp.,) Transferee)	
)	

DECLARATION OF ROBERT H. GERTNER

I. QUALIFICATIONS

1. I, Robert H. Gertner, am Professor of Economics and Strategy at the Graduate School of Business of The University of Chicago. I received an A.B., summa cum laude, from Princeton University in 1981, where I majored in Economics, and a Ph.D. from the Massachusetts Institute of Technology in 1986, also in Economics. I am a Research Fellow at the National Bureau of Economic Research. In 1990-91 I was a John Olin Fellow in Law and Economics at The University of Chicago Law School. I specialize in the economics of industrial organization (the study of individual markets which includes the study of antitrust, regulation, and business strategy), game theory (the formal study of strategic interdependence), law and economics, and corporate finance. I am co-author of Game Theory and the Law, a book that applies the modern tools of game theory and information economics to legal issues. I have published numerous articles in academic journals including the Journal of Law and Economics, the Rand Journal of Economics, the Quarterly Journal of Economics, and the Journal of

Finance. I am Co-Editor of the <u>Journal of Business</u>, a leading journal that publishes academic research applying economics to business problems, and Associate Editor of the <u>Journal of Industrial Economics</u>. I have taught courses at The University of Chicago in competitive strategy, industrial organization, financial economics, corporate law, and antitrust law. A copy of my curriculum vitae that includes a list of my publications during the past 10 years is attached as Exhibit 1.

2. In addition to my academic experience, I am Principal and Vice-President of Lexecon Inc., an economics consulting firm that specializes in the application of economic analysis to legal and regulatory matters. I have served as an expert on various matters including a variety of telecommunications matters. My attached curriculum vitae lists the expert testimony that I have provided in the past four years.

II. SUMMARY OF OPINIONS AND OVERVIEW

- 3. I have been asked by Bell Atlantic and GTE to analyze the potential impact of AT&T's proposed acquisition of MediaOne on competition in the provision of Internet services. As the starting point for my analysis, I assume that the proposed transaction would bring the two leading providers of broadband Internet access, @Home and Road Runner, under common control.¹ @Home is controlled by AT&T and MediaOne is (by a wide margin) Road Runner's largest shareholder. These firms have exclusive contracts to provide broadband Internet access, including last-mile transport as well as interconnection to the Internet backbone and value-added services (ISP services), on cable systems serving the vast majority of potential cable suppliers in the United States.
 - 4. My principal conclusions are as follows:
 - The proposed merger raises the risk of harm to competition in the provision of broadband Internet content and further raises the risk of anticompetitive harm in the

^{1.} The service is now known as "Excite@Home" following the recent merger of these firms. For simplicity, I refer to this company throughout this report as @Home.

- provision of broadband Internet access services based on alternative technologies, such as Digital Subscriber Line (DSL) service.
- AT&T's Application for Transfer and Control (hereafter, AT&T's Application) provides
 no cogent explanation of why its refusal to allow consumers to purchase last-mile
 transport and Internet access on an unbundled basis would prevent it from realizing
 the benefits it claims will result from the proposed transaction.
- Some of the potential anticompetitive problems raised by the merger could be avoided by requiring AT&T to separate the provision of last-mile transport and ISP service by allowing consumers to obtain ISP services from providers unaffiliated with @Home and Road Runner on an open and non-discriminatory basis. In the absence of any efficiency rationale for AT&T's strategy, this requirement is likely to benefit consumers.
- 5. Section III of this report discusses why it is appropriate to evaluate the proposed transaction in the context of a market defined to include broadband Internet access services. I also discuss why, as a policy matter, it is inappropriate to discount risks of harm to competition from the proposed transaction simply because broadband Internet technology is a new service with relatively few subscribers today relative to narrowband. Section IV shows how the proposed transaction raises the risk of harm to competition in the provision of "upstream" broadband content services as well as the risk of anticompetitive harm to firms attempting to provide broadband Internet access through alternatives to the @Home/Road Runner technology. Section V discusses how the imposition of an "open access" requirement would greatly reduce the risk of harm to competition resulting from the proposed transaction.

III. THE TRANSACTION SHOULD BE EVALUATED IN THE CONTEXT OF A MARKET FOR BROADBAND INTERNET ACCESS SERVICES

6. @Home and Road Runner are the two leading providers of cable-based broadband Internet access services, which are defined here to include "last mile" Internet

transport as well as services such as interconnection to the Internet backbone and related ISP services. Together with cable companies, both @Home and Road Runner provide these transport and ISP services on a "tied" basis and do not provide access to other ISPs to serve customers that prefer only to purchase transport services from @Home and Road Runner. @Home and Road Runner and their cable companies provide what is sometimes referred to as a "closed" system.

- 7. Together, @Home and Road Runner are the exclusive providers of broadband Internet access services via cable on eight of the 10 largest cable systems in the U.S.² Cable systems that are partners in or affiliates of @Home or Road Runner pass 79 million homes, roughly 82 percent of all cable homes passed in the United States.³ AT&T has a 58 percent voting interest in @Home, while MediaOne has a 50 percent management interest in Road Runner.⁴ As noted above, for the purposes of my analysis, I assume that the proposed transaction would bring @Home and Road Runner under the control of AT&T.
- 8. While the provision of residential broadband services is in its infancy, @Home and Road Runner accounted for nearly 80 percent of all U.S. broadband subscribers, as of June 1999. Recent data indicate that @Home now provides service to 395,000 U.S. subscribers while Road Runner provides service to roughly 350,000 subscribers.⁵ Roughly 200,000

2. Forrester Report, "Cable's Multiservice Future," (February 1999), p. 5. A ninth, Adelphia Communications, was recently acquired by AT&T. (Strategis Group, "High Speed Internet Access -- 1998/99," Dec. 1998, pp. 129-30).

4. Wall St. Journal, Corrections and Amplifications, August 11, 1999, p. A2; P. Farhi, AT&T Poised to Regain Long Reach, Via Cable, Wash. Post, May 6,1999. Partners with AT&T in @Home include Cox Communication and Comcast; MediaOne's partners in Road Runner

^{3.} Cable systems wholly owned by AT&T and MediaOne provide service to 28 percent of cable subscribers in the U.S. In addition, MediaOne has a 25 percent ownership interest in Time-Warner Cable, which accounts for 21 percent of cable subscribers and AT&T has 32 percent of the Class A common shares of Cablevision, which accounts for 6 percent of cable subscribers. In addition, AT&T has an interest in numerous other cable operators. [Warren Publishing, "Cable and Station Coverage Atlas" (1999); TimeWarner 10-K (March 16, 1999); CSC Holdings, Inc. (March 31, 1999); At Home 10-Q, May 17, 1999.]

include TimeWarner, Microsoft and Compaq.

5. Kinetic Strategies, "Cable Modern Customer Count Tops 1 Million," Cable Datacom News, August 1999, at 2 <www.CableDatacomNews.com>; Jupiter Communications, "Broadband Barriers: Partnering Effectively with Dominant Cable ISPs," May 1999; CNET News.com, "The Pitfalls of High-Speed Installs," July 28, 1999. J.A. Savas, Merrill Lynch Merrill Lynch Capital Markets, Investex Report. No. 3365477, Rhythms Net Connections -- Company

customers obtain broadband Internet access from either DSL, satellite or other cable-based broadband providers.⁶ Analysts expect that cable providers will provide access to the vast majority of residential broadband Internet subscribers for the next several years.⁷

- 9. As a starting point in analyzing the proposed transaction, it is important to recognize that the vast majority of homes in the U.S. can obtain cable services from only a single supplier. Thus, the merger of AT&T and MediaOne does not reduce the number of suppliers of broadband Internet services to a significant number of customers. Nonetheless, the transaction effectively places under common control access to roughly 80 percent of residential broadband customers. As a result, suppliers of various types of Internet content that can be economically supplied via broadband but not narrowband systems must rely on AT&T to distribute this content.
- 10. In addition to providing high-speed access to "traditional" Internet services such as the world-wide web, broadband permits the introduction of a variety of Internet services that cannot be economically provided to residential customers via narrowband systems. A few examples include:
 - Streaming video and audio services (such as news and sports video clips, movies and television on demand);
 - Teleconferencing services (e.g., for home offices, doctor visits, etc.)
 - High speed access to corporate networks for telecommuters
 - Home shopping and video catalog services

(...continued)

Report (October 30, 1998); Deployment and Projections, TeleChoice Survey, Q2 1999 www.xdsl.com/content/resources/deployment_into.asp; David Crowe, "Technical Problems Raise Doubts," Australian Financial Review, June 26,1999.

7. "Study Sees Cable Modern Deployments Surpassing ADSL installations by 2003," Broadband Networking News, Aug. 4, 1998; Forrester Report, "From Dial-Up to Broadband" (April 1999), p. 7.

8. The merger would eliminate a potential competitor to the extent that AT&T and MediaOne would have constructed new facilities (e.g., overbuild) in each other's territory absent the merger. I do not address the potential competitive impact of the proposed transaction in this report.

^{6.} In contrast, there are now roughly 35 million residential narrowband (i.e. dial-up) subscribers. (Forrester Report, "From Dial-Up to Broadband," April 1999, p. 3.)

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- Interactive games
- High speed downloads of music, video, software, etc.
- 11. There is no dispute that broadband access will result in the introduction of a wide variety of new Internet services that are valued by consumers. The fact that these services cannot be provided via narrowband systems means that the proposed transaction must be evaluated in the context of a market for broadband Internet access services. The presence of a large number of providers of narrowband access services does not preclude AT&T, the provider of broadband access services to 80 percent all current residential broadband customers, from exercising market power in its relationships with "upstream" suppliers of broadband content.
- 12. However, AT&T's Application fails to recognize this point and instead asserts AT&T cannot exercise market power because broadband and narrowband services are close substitutes (combined with the fact that there are a large number of providers of narrowband services, including well-established competitors such as America On-Line). ¹⁰ AT&T's claim is belied by the following:
 - The price charged by cable providers for services provided by @Home and Road Runner are well above those charged by providers of narrowband services. I understand that @Home and Road Runner subscribers typically pay between \$40 and \$50 per month, 11 while narrowband services, such as AOL charge \$22 per month. 12 These price differences reflect the fact that customers value the access to broadband Internet services and high speed access to traditional services more than conventional narrowband access. While not dispositive, these price differences indicate that there are considerable differences in the nature of the services offered by narrowband and broadband suppliers. 13

^{9.} For example, @Home's web site extolls the virtues of "A Revolutionary Online Experience" provided by the broadband service that cannot be obtained through narrowband services. <www.home.com/content.html>

^{10.} AT&T Application, p. 72.

^{11.} Strategis Group Report, p. 184.

^{12.} www.aol.com/info/pricing.html.

^{13.} Comparison of narrowband and broadband prices is complicated by the fact that ISPs such

- Prices charged by cable companies for @Home and Road Runner vary from area to area although prices charged by narrowband providers are generally uniform nationwide. For example, @Home's web site notes that "prices vary by area." In contrast, AOL, the leading provider of access to narrowband services, offers service at a flat rate throughout the United States. While this evidence again is not dispositive, if narrowband and broadband services were close substitutes, the price of broadband services would not be expected to vary by region in the presence of a national competitor offering a flat rate price.
- AT&T's large investment in acquiring cable systems, and its large investment in
 upgrading these systems to offer broadband Internet services is inconsistent with its
 claim. If narrowband and broadband Internet access were close substitutes, then
 AT&T would be expected to undertake the less costly investment of providing
 narrowband services.
- 13. These factors suggest that It is inappropriate to treat broadband and narrowband access services as being in the same market. Because broadband services provide (at least the promise of) access to very different types of content, the availability of narrowband distribution would not prevent a monopolist of broadband access from exercising market power with respect to firms that supply broadband-specific content.
- 14. AT&T further suggests that it would be unable to exercise market power as a provider of broadband services due to the presence of alternative broadband technologies, such as satellite, fixed wireless, etc.¹⁵ While these alternative broadband technologies may eventually provide competition to broadband access through cable systems in the future, they

^{(...}continued)

as AOL provide value-added services such as proprietary content in addition to connection to the Internet backbone. The comparison is further complicated by the fact that the "price" of narrowband access for some consumers should include a portion of the cost of a second telephone line.

^{14.} www.home.com/pricing.html.

^{15.} AT&T Application, p. 72, 74.

provide service to few customers today and analysts do not expect these to serve many customers in the near future. As noted above, @Home and Road Runner provide service to roughly 80 percent of broadband customers and this advantage is likely to persist for several years, even in the absence of the proposed transaction.

- 15. As explained in more detail in Section IV below, competitive concerns arising from the potential transaction are the result of AT&T's ability to disadvantage rivals as the result of its position in the marketplace today. The potential viability of alternative broadband technologies such as DSL and fixed wireless in providing residential broadband access is of limited relevance in evaluating the competitive impact of the proposed transaction if the viability of these alternatives is put at risk as the result of AT&T's strategy.
- 16. The fact that broadband Internet access is a new service with little market penetration today does not mean that the proposed transaction is immune to antitrust concerns or that the magnitude of the potential harm to consumer welfare is small. To the contrary, firms with market power may use strategic behavior to adversely affect the development of emerging technologies. At the same time, interference in the development of emerging technologies can preserve market power in existing industries. For example, inhibiting competition in the provision of broadband video services can protect the existing market power enjoyed by AT&T and others in the provision of cable television services.
- 17. If successful, the effects of such behavior may be long-standing. It is well recognized that firms that succeed in establishing an early foothold in deploying new services in technology industries may gain permanent advantages. Examples include Microsoft and the variety of new Internet-based retailers that have invested a great deal in the hope that gaining an early advantage will lead to long-run profits. While early-mover advantages can be the consequence of demand and supply conditions in an industry, antitrust policy should attempt to

16. See note 7 above.

^{17.} See D. Carlton and M. Waldman, "The Strategic Use of Tying to Preserve and Create Market Power in Evolving Industries" (July 1999).

prevent firms from inefficiently gaining such advantages through the exercise of market power. It is important that competition involving different technologies be determined based on economic efficiency, not the ability of firms with market power to act to harm rivals. As attested to by AT&T's large investments to date, competition to provide broadband Internet access services is likely to have a significant impact on consumer welfare.

- IV. RISKS OF HARM TO COMPETITION IN THE PROVISION OF BROADBAND INTERNET SERVICES FROM THE PROPOSED MERGER OF AT&T AND MEDIAONE
- 18. As discussed above, the merger of AT&T and MediaOne bring under common control @Home and Road Runner, the two largest suppliers of broadband Internet access services. @Home and Road Runner together have exclusive contracts to provide broadband Internet access services to the vast majority of homes served by cable and today account for 80 percent of subscribers to broadband Internet services.
- 19. As a result of the transaction, suppliers of broadband-specific Internet content would, for the foreseeable future, be made more dependent upon AT&T for distribution of their services. At the same time, AT&T is pursuing a strategy of establishing preferential relationships with suppliers of broadband content. As mentioned above, AT&T ties the provision of its last mile broadband transport service with access (ISP) services. This prevents potential rivals in the provision of ISPs service from competing with @Home.¹⁸ AT&T is not required to provide non-discriminatory access to suppliers of broadband services, unlike ILECs who face such requirements in providing DSL services.
- 20. These circumstances -- AT&T's strategy of establishing preferred suppliers, combined with its position today as the supplier of access to the vast majority of residential broadband subscribers -- creates risk of harm to competition in the provision of both: (i) broadband content; and (ii) broadband Internet access.

^{18.} For example, @Home subscribers cannot obtain Internet access services through AOL although they can subscribe to and obtain content provided by AOL.

- 21. By establishing AT&T as a near monopolist in the distribution of broadband services today, the proposed transaction increases AT&T's ability to impose significant costs on unaffiliated providers of broadband services. Suppliers that do not establish preferential relationships with AT&T may face significant difficulties in distributing their services. In the absence of alternative channels of broadband distribution, disfavored providers of broadband services may be driven from the market or may fail to achieve the scale required to provide services efficiently. The risk that suppliers of broadband content may be foreclosed from efficient distribution of their services may deter investment in these services.
- 22. For example, AT&T's entry into an preferential arrangement with a provider of streaming video service may place providers of rival video services at a significant competitive disadvantage. As a result, these rivals may be forced to operate at an inefficient scale or may be driven from the market. These circumstances can result in the creation of a streaming video supplier with the ability to exercise market power.
- 23. I understand that discrimination against the unaffiliated providers of broadband services may not be avoided when consumers attempt to circumvent, or "click through," AT&T's preferred supplier to access an alternative provider. To the contrary, I understand that AT&T can grant its preferred content providers technological advantages that cannot be duplicated by others. For example, I understand that AT&T may be able to provide its affiliated content provider unique advantages by providing them the exclusive ability to "cache" data at the server located nearest the consumer. At the same time, AT&T would be able to degrade the quality of competing services provided by rivals.¹⁹
- 24. In this way, the transaction enables AT&T to use its position as a near-monopolist in the provision of broadband access to harm competition in adjacent markets, resulting in harm to consumers of such services. Even if other forms of broadband access eventually provide

^{19.} I understand, for example, that AT&T has the ability to limit providers of streaming video suppliers to film clips no longer than ten minutes in lengths. Presumably, a variety of such mechanism could be used to disadvantage broadband services provided by rivals to AT&T's preferred suppliers.

alternatives to @Home and Road Runner, harm to competition in the provision of broadband content today could have long-lasting effects as the broadband content providers that face discrimination by AT&T will fail to emerge as viable competitors.

- 25. Moreover, AT&T's strategy can adversely affect the development of DSL and other broadband Internet access services that compete with AT&T. For example, AT&T could engage in a strategy which required upstream providers to distribute their broadband content exclusively through AT&T affiliated systems. This could raise significantly the costs faced by rival providers of broadband access services in establishing a package of broadband services that would be attractive to subscribers. Even if AT&T entered into non-exclusive agreements with firms providing broadband content, it still could require its preferred suppliers to make service upgrades available to AT&T customers before they are made available to subscribers on other systems. This, again, would raise the costs faced by rival providers of broadband access services.
- AT&T could have an incentive to develop proprietary software and network protocols that would prevent broadband Internet applications provided by AT&T preferred providers from being readily applied on DSL or other broadband access technologies. Establishment of such protocols also could lead developers of broadband content to develop and deploy software and content on AT&T network before developing similar applications for other broadband Internet access providers. These strategies would help preserve AT&T's current position as the leading provider of broadband Internet access and would raise the costs faced by providers of rival broadband access technologies, such as DSL, from offering access services that compete with AT&T's.
- 27. Any reduction in competition in the provision of broadband content resulting from AT&T establishing preferred supplier relationships or establishing proprietary software and network protocols would raise the costs faced by DSL (and other competing service), making them less effective competitors to AT&T. This increases AT&T's ability to maintain its current

position as a near monopolist in the provision of broadband Internet access services, to the detriment of consumers.

- 28. AT&T's strategy of establishing preferential relationships with suppliers of broadband content reveals that AT&T considers this "closed" system to be more profitable than operating under an "open access" structure. This structure benefits AT&T by allowing it to extract a portion of the upstream profits created by establishing preferential relationships with providers of broadband content and imposing costs on their rivals, perhaps by setting (implicit or explicit) fees charged to content providers for distribution of broadband content.²⁰
- 29. I am aware of no efficiency rationale for AT&T's decision to deploy a "closed" system and to establish preferential relationships with content providers. I understand, for example, that there are no technological impediments to offering broadband Internet access on over cable systems on an "open" basis.²¹ In the absence of such efficiency considerations, the proposed transaction increases the risk of significant harm to consumers without generating offsetting benefits. AT&T instead has argued simply that the closed system would generate higher profits than an open one that these profits are necessary to justify its investment. Again, I am not aware of any evidence that AT&T has presented to support these claims.

^{20.} If broadband Internet "access" and "content" were consumed in fixed proportions, and in the absence of external effects, then AT&T could fully extract the value of its market power through the access fees charged to subscribers. The profits that AT&T could earn under such circumstances could not be increased through vertical integration and/or establishment of preferential relationships with content suppliers. It is highly unlikely, however, that broadband access and content are consumed in fixed proportions. Subscribers inevitably will vary with respect to the intensity of demand for various broadband services and it is unlikely that AT&T could identify the intensity of individual subscribers demands and varying the access prices they charged in response. In addition, by creating market power in upstream services, AT&T may be able to capture a portion of the resulting profits earned by content providers on sales to customers that obtain Internet access from firms other than AT&T.

^{21.} I understand that GTE has demonstrated the viability of open access cable based broadband Internet services in a trial in Clearwater, Florida. See accompanying Declaration of Albert Parisian.

V. THE RISK TO COMPETITION COULD BE OBVIATED BY REQUIRING AT&T TO PROVIDE OPEN ACCESS TO UNAFFILIATED ISPS

- 30. The proposed transaction creates the risk of harm to competition by establishing AT&T as access provider to the vast majority of broadband Internet subscribers. This position increases AT&T's incentive and ability to engage in a strategy of discriminating against unaffiliated providers of broadband Internet content and prevents them from gaining efficient distribution of their services. In turn, the foreclosure risks created by the transaction could result in harm to competition in the provision of (i) broadband Internet content; and (ii) broadband Internet access services.
- 31. These risks can be obviated by requiring AT&T to provide access to unaffiliated ISPs on a non-discriminatory basis. With ISPs able to compete to provide services to @Home's and Road Runner's subscribers, the success of various broadband services will be determined by consumer preferences, not choices made by AT&T regarding the firms with which it chooses to establish a preferred relationship. While individual ISPs, including @Home and Road Runner, would still be able to establish preferred relationships with suppliers of broadband Internet content, firms that fail to gain a preferred relationship with @Home and Road Runner nonetheless could readily establish similar relationships with other ISPs, and would not be put at a competitive disadvantage as the result of AT&T's strategy. Similarly, requiring AT&T to provide open access to unaffiliated ISPs would reduce the risk that rival broadband access services, such as DSL, would be harmed by the failure of competition to develop in the provision of broadband content services.
- 32. As mentioned above, I am unaware of any efficiency rationale for AT&T's decision to tie the provision of transport and ISP services. I understand that open access cable-based Internet broadband services have been demonstrated by GTE and that Canada has

^{22.} I understand that such a requirement would enable ISPs to access only the cable provider's transport facilities.

mandated such systems.²³ Moreover, an open access requirement would leave unaltered AT&T's ability to charge an unregulated price for broadband Internet transport.

VI. CONCLUSION

- 33. The proposed merger of AT&T and MediaOne creates the risk of harm to competition in the provision of (i) broadband Internet content and (ii) broadband Internet access services. This is the consequence of two factors: (i) the merged company's large role in the provision of broadband Internet access services today; and (ii) AT&T's strategy of not offering its broadband Internet services on an "open access" basis. Instead, AT&T has chosen to tie the provision of last-mile broadband Internet transport and the provision of ISP services, one aspect of a broader policy of establishing preferential relationships with suppliers of broadband content.
- 34. The proposed transaction risks harm to competition by increasing the dependence of broadband content providers on AT&T and thus increasing AT&T's incentive and ability to impose costs on unaffiliated providers of broadband services. Suppliers of broadband content that fail to establish preferential relationships with AT&T may be driven from the market or may be forced to operate at an inefficiently small scale. Similarly, the transaction increases AT&T's incentive to establish proprietary software and network protocols that give content suppliers incentives to first offer new services or upgrades of existing services to AT&T.
- 35. Such actions would be expected to profit AT&T, which may be able to extract a portion of the rents earned by favored upstream suppliers. In addition, AT&T's strategy is likely to benefit AT&T by limiting the availability of broadband content that can readily by distributed over DSL. Because broadband Internet services are likely to compete with traditional television programming, AT&T's actions have the further effect of helping to protect AT&T's market power as a local monopolist in the provision of cable television services.

^{23.} Canadian Radio-Television and Telecommunications Commission, Telecom Decision RTC 99-8, Regulation Under the Telecommunications Act of Cable Carriers' Access Services, File No.: 8697-C12-02/98.

- 36. These risks of harm to competition can be obviated by requiring @Home and Road Runner to provide access to unaffiliated ISPs on a non-discriminatory basis. An "open access" structure greatly reduces AT&T's incentive and ability to impose costs on unaffiliated suppliers of broadband services and leaves the determination of the marketplace success of these services in the hands of consumers, not AT&T. AT&T has presented no evidence that its "closed" model is required in order to justify its investment in broadband Internet access services. In the absence of any efficiency rationale for AT&T's strategy, an "open access" requirement is likely to benefit consumers.
- 37. AT&T's suggestion that market power concerns are irrelevant due to competition from narrowband providers misses the point. There are a wide variety of broadband-specific services that narrowband providers cannot provide. Narrowband suppliers cannot constrain AT&T's market power in the distribution of broadband services, and the magnitude of AT&T's investment indicates the commercial importance of broadband services is likely to be very large. Potential competition to AT&T from alternative broadband access technologies also is of limited relevance if AT&T's actions are successful in interfering with their emergence in the marketplace.

I declare under penalty of perjury that the foregoing is true and correct.

Robert H. Gertner

August 19, 1999

Robert H. Gertner

Principal and Vice President

Business Address: Lexecon Inc.

332 S. Michigan Avenue Chicago, Illinois 60604

(312) 322-0200

Graduate School of Business The University of Chicago 1101 East 58th Street Chicago, Illinois 60637

(773) 702-7203 Fax: (773) 702-2044

E-mail:rob.gertner@gsb.uchicago.edu

Home Address:

5557 South Kenwood Avenue

Chicago, Illinois 60637

(773) 363-9079

EDUCATION

Massachusetts Institute of Technology, Ph.D., September, 1986. Thesis Title: "Essays in Theoretical Industrial Organization."

Princeton University, A.B., summa cum laude, June, 1981, major in Economics.

EMPLOYMENT

Professor of Economics and Strategy, Graduate School of Business, The University of Chicago, September 1995 - present.

Research Fellow, National Bureau of Economic Research, October 1994 - present.

Associate Professor of Economics and Strategy, Graduate School of Business, The University of Chicago, April 1995 - August 1995.

Associate Professor of Business Economics, Graduate School of Business, The University of Chicago, September 1990 - April 1995.

Visiting Associate Professor of Management and Strategy, J. L. Kellogg Graduate School of Management, Northwestern University, September 1994 - March 1995.

Assistant Professor of Business Economics, Graduate School of Business, The University of Chicago, September 1986 - August 1990.

Full-time Consultant, American Telephone and Telegraph Company, Microeconomic Analysis Group, September 1981 - July 1982.

OTHER POSITIONS

Editor, Journal of Business, July 1995 - present.

Associate Editor, Journal of Industrial Economics, August 1995 - present.

FELLOWSHIPS AND GRANTS

John M. Olin Visiting Fellow in Law and Economics, The Law School, University of Chicago, 1990 - 1991.

IBM Corporation Scholar, University of Chicago, Graduate School of Business 1989 - 1990.

National Science Foundation Research Grant, "Bankruptcy and the Costs of Financial Distress," 1989 - 1991.

Visiting Scholar, CEPREMAP, Paris, France, April 1988.

Alfred P. Sloan Foundation Doctoral Dissertation Fellowship, 1985 - 1986.

National Science Foundation Graduate Fellowship, 1982 - 1985.

ACADEMIC PUBLICATIONS

BOOK:

Game Theory and the Law, (with Douglas Baird and Randal Picker), Harvard University Press, November 1994.

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- "Internal Capital Markets," March, 1995.
- "Revenue and Efficiency Differences Between Sequential and Simultaneous Auctions with Limited Information," October, 1995.
- "Coordination, Dispute Resolution, and the Scope of the Firm," April, 1996.
- "Price Fixing Under the Sherman Act: The New Learning from Game Theory," with Andrew Rosenfield), May, 1996.
- "The Value-Maximizing Board," (with Steven Kaplan), December, 1996.

CASE STUDIES

"The Feature Animation Industry in 1995: Challenging Disney's Supremacy," (with Stacey Roth), March, 1995, revised, September, 1995.

"Selling the Radio Spectrum: The 30 MHz MTA PCS Auction," April 1995.

TEACHING EXPERIENCE

Microeconomics (M.B.A.)

Applied Microeconomics (M.B.A./Ph.D.)

Industrial Organization (Ph.D.)

Financial Markets and Institutions (M.B.A.)

Competitive Strategy (M.B.A.)

Corporation Law (J.D.)

Business Policy (M.B.A.)

Management of Organizations (M.B.A. Kellogg)

Seminar on Advanced Antitrust (J.D.)

Advanced Competitive Strategy: Game Theory in Practice (M.B.A.)

ADDITIONAL EXPERIENCE

- Analysis of antitrust and strategic issues in mergers, joint ventures, and monopolization litigation with Lexecon Inc.
- Consultant of a variety of strategic management issues including incentive compensation, supplier relationships, and acquisitions.
- Auction design and bidding adviser to WirelessCo. (joint venture of Sprint, TCl, Cox Cable, and Comcast) and AirLink L.L.C. in FCC spectrum auctions.
- Lost profit and valuation analysis in corporate litigation.
- Testimony before the Federal Trade Commission on Consumer Protection and Antitrust in Cyberspace.

CASES IN WHICH I PROVIDED DEPOSITIONS OR TRIAL TESTIMONY:

- Stratosphere Corporation, and Stratosphere Gaming Corp., United States Bankruptcy Court, District of Nevada, CN BK-S 97-20554-GWZ and BK-S 97-20555-GWZ, Deposition and trial testimony, in a case where the central economic issue was the structure of a credit enhancement to a loan agreement, February 1998.
- Trio Holdings et. al. v. Columbus Investment et. al. Cook County Circuit Court, Deposition and trial testimony on economic incentives in partnership and damages from self-dealing, for defendant, November 1997.
- Ellen Steffen et. al. v. Playmobil USA, Inc., United States District Court, Eastern District of New York, CV 95 2896, CV 96 3937, CV 96 3938, Deposition on economic issues in a vertical price fixing case, for defendant, May, 1997.
- Hi-Lite Products v. American Home Products, United States District Court, Northern District of Illinois, Case 92 C 0384, Deposition and trial testimony on damages a contract breach case, for plaintiff, January 1996.